

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

Listing Of Claims:

1 through 20. Cancelled.

82. (Previously Presented) An adaptive drive system for a motor vehicle comprising, in combination,

a first drive line having a first drive shaft, a first differential, a first pair of axles, a first pair of wheels and at least one first speed sensor for providing a first drive line speed signal,

a second drive line having a second drive shaft, a second differential, a second pair of axles, a second pair of wheels and at least one second speed sensor for providing a second drive line speed signal,

a transfer case having an input, a first output adapted to drive said first drive line, a second output adapted to drive said second drive line and a clutch operably disposed between said first output and said second output, and

a controller for receiving a first speed signal from said first speed sensor and a second speed signal from said second speed sensor, determining the difference between said first and said second speed signals, increasing electrical current to said clutch by a predetermined amount in response to said speed signal difference exceeding a computed threshold and increasing said electrical current to said clutch by additional predetermined amounts while said speed signal difference exceeds said computed threshold.

83. (Previously Presented) The adaptive drive system of claim 82 wherein said predetermined amounts are equal in magnitude.

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

84. (Previously Presented) The adaptive drive system of claim 82 wherein said predetermined amounts are equal in duration.

85. (Previously Presented) The adaptive drive system of claim 82 wherein said controller decreases said electrical current by predetermined amounts while said speed signal difference is less than said computed threshold.

86. (Previously Presented) The adaptive drive system of claim 82 further including a throttle position sensor providing a signal to said controller and wherein said predetermined amounts reduce in magnitude as said signal from said throttle position sensor increases.

87. (Previously Presented) The adaptive drive system of claim 82 wherein said speed signals represent an average speed of an associated said pair of wheels.

88. (Previously Presented) The adaptive drive system of claim 82 wherein said controller provides a minimum electrical current to said clutch.

89. (Previously Presented) The adaptive drive system of claim 88 wherein said controller reduces said predetermined amounts as said minimum electrical current is increased.

90. (Currently Amended) ~~[[The]]~~ An adaptive drive system for a motor vehicle comprising, in combination,

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

a first drive line having a first differential, a first pair of axles, a first pair of wheels and at least one first drive line speed sensor,

a second drive line having a second differential, a second pair of axles and a second pair of wheels and at least one second drive line speed sensor,

a clutch operably disposed between said first drive line and said second drive line, and

a microcontroller for receiving data from a plurality of sensors including said first and second drive line speed sensors and computing a slip threshold, increasing [[said]] an electrical current to said clutch in steps so long as said sensed wheel speed difference exceeds said computed slip threshold.

91. (Currently Amended) The adaptive drive system of claim [[89]] 90 wherein said microcontroller decreases said electrical current to said clutch in steps when said speed signal difference no longer exceeds said computed slip threshold.

92. (Previously Presented) The adaptive drive system of claim 90 wherein said steps are of equal magnitude.

93. (Previously Presented) The adaptive drive system of claim 90 wherein said steps are of equal duration.

94. (Previously Presented) The adaptive drive system of claim 90 wherein said microcontroller provides a minimum electrical current to said clutch.

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

95. (Previously Presented) The adaptive drive system of claim 94 wherein said microcontroller reduces said steps as said minimum electrical current is increased.

96. (Previously Presented) The adaptive drive system of claim 94 wherein said microcontroller adjusts said minimum electrical current in response to a signal from a throttle position sensor.

97. (Previously Presented) The adaptive drive system of claim 90 wherein a greater number of said steps corresponds to smaller magnitudes of said steps.

98. (Previously Presented) The adaptive drive system of claim 90 wherein said steps are a function of one of throttle position and brake system activation.

99. (Previously Presented) An adaptive drive system for a motor vehicle comprising, in combination,

a first drive line having a first differential, a first pair of axles and a first pair of wheels,

a second drive line having a second differential, a second pair of axles and a second pair of wheels,

a clutch operably disposed between said first drive line and said second drive line,

a plurality of vehicle condition sensors including first and second drive line speed sensors.

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

a controller for receiving data from said plurality of vehicle condition sensors including said drive line speed sensors, computing a speed difference based upon data from said drive line speed sensors, computing a slip threshold based upon data received from said plurality of sensors and increasing electrical current to said clutch by predetermined amounts if said sensed speed difference exceeds said slip threshold and continuing to increase said clutch current by said predetermined amounts while said wheel speed difference exceeds said slip threshold.

100. (Previously Presented) The adaptive drive system of claim 99 wherein said predetermined amounts are equal in magnitude.

101. (Previously Presented) The adaptive drive system of claim 99 wherein said predetermined amounts are equal in duration.

102. (Previously Presented) The adaptive drive system of claim 99 wherein said plurality of sensors includes a throttle position sensor and a brake activation sensor.

103. (Previously Presented) The adaptive drive system of claim 99 said controller decreases said electrical current by said predetermined amount when said speed signal difference no longer exceeds said slip threshold.

104. (Previously Presented) The adaptive drive system of claim 99 wherein said controller provides a minimum electrical current to said clutch.

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

105. (Previously Presented) The adaptive drive system of claim 104 wherein said controller reduces said predetermined amounts as said minimum electrical current is increased.

106. (Currently Amended) The adaptive drive system of claim ~~[[99]]~~ 104 wherein said controller adjusts said minimum electrical current in response to a signal from a throttle position sensor.

107. (Previously Presented) The adaptive drive system of claim 99 wherein said driveline speed sensors provide an average speed of an associated said pair of wheels.

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

II. Election of Species

Applicants' attorney acknowledges the Requirement to Restrict mailed April 14, 2004. Said Requirement to Restrict contained both a request for election between Groups I, II and III claims and a request for election of Species I and II and allegedly patentably distinct Subspecies III and IV.

Inasmuch as a Preliminary Amendment was filed canceling claims 1 through 81 and submitting new claims 82 through 107 directed to an adaptive drive system, it is submitted that the requirement to elect among claim Groups I, II and III is moot.

Given the scope and content of newly submitted claims 82 through 107, the undersigned believes there is substantial support for the position that the election of species has also been mooted. Nonetheless, a Notice of Non-Compliant Amendment issued addressing the omission of the election of species. Accordingly, and in order to provide a plenary response to the Notice of Non-Compliant Amendment, Applicants' attorney hereby elects Species I illustrated in Figure 4 and Subspecies III illustrated in Figure 5a.

The election of Species I is without traverse whereas the election of Subspecies III, illustrated in Figure 5a, is with traverse. Figure 5a presents an alternate embodiment of a front-wheel drive vehicle wherein the clutch referenced in all the claims is disposed adjacent and forward the rear differential. While this (as well as the configuration Figure 5b) is a fully viable powertrain configuration, the most common configuration is that illustrated in Figure 1 wherein the clutch is disposed within a transfer case which is to the rear of and immediately adjacent the vehicle transmission.

As drafted and intended, the claims presently under consideration do not address and make no distinction regarding the location of the clutch. Accordingly,

U.S. Serial No. 10/632,352

Attorney Docket No. 91043H

the election of species, aside from the fact that it requires Applicants' choice between two drivetrain configurations, wherein three exist, also appears to suggest that certain claims may or would be excluded by such election. This is not the case.

Accordingly, and responsive to this issue, Applicants state that claims 90 through 107 are readable upon the elected Species I and Subspecies III.

Finally, and in view of the foregoing, Applicants request substantive examination of claims 90 through 107. Upon allowance of either independent claim 90 or 99, Applicants submit that they will be entitled to consideration of claims to additional species which include all the limitations of the allowed generic claim as provided by 37 C.F.R. §1.141.

Respectfully submitted,

Dated: October 26, 2004

By: David D. Murray
David D. Murray
Registration No. 28,647
Attorney for Applicants

BRINKS HOFER GILSON & LIONE
P.O. Box 10395
Chicago, IL 60610
Telephone: (734) 302-6000